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SLH 2
#3
cond.

consisting of] an alpha2 subunit of a human nicotinic acetylcholine receptor that is encoded by nucleic acid comprising the sequence of nucleotides set forth SEQ ID No. 1 and 3 , an alpha3 subunit of a human nicotinic acetylcholine receptor that is encoded by nucleic acid comprising the sequence of nucleotides set forth in SEQ ID No. 5 and 7 [and] or a beta2 subunit of a human neuronal nicotinic acetylcholine receptor that is encoded by nucleic acid comprising the sequence of nucleotides set forth in SEQ ID No. 9.

SLH 3

55. (Twice amended) [A substantially pure] An isolated human neuronal nicotinic acetylcholine receptor α subunit [of the human neuronal nicotinic acetylcholine receptor] encoded by the nucleic acid of claim 53 and comprising the sequence of amino acids encoded by SEQ ID No. 1 or 3, or comprising the sequence of amino acids encoded by SEQ ID No. 5 or 7.

56. (Twice Amended) [A substantially pure] An isolated human neuronal nicotinic acetylcholine receptor β subunit [of the a human neuronal nicotinic acetylcholine receptor] encoded by the nucleic acid of claim 53 and comprising the sequence of amino acids encoded by SEQ ID No. 9.

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57. (Amended) An isolated nucleic acid, comprising [a sequence of] nucleotides that [encodes] encode [a] an α_3 or β subunit of a human neuronal nicotinic acetylcholine receptor and [hybridizes] hybridize under conditions of high stringency to a [sequence of nucleotides encoding a subunit of claim] the nucleic acid of claim 53.

58. (Amended) The nucleic acid of claim [54] 53, [wherein said nucleic acid comprises a sequence of nucleotides selected from the group consisting of:] that comprises a sequence of nucleotides encoding an alpha2 subunit and having the restriction map of the DNA encoding the human alpha2 subunit set forth in Figure 1,

a sequence of nucleotides encoding an alpha3 subunit and having the restriction map of the DNA encoding the human alpha3 subunit set forth in Figure 2, [and] or a

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a sequence of nucleotides encoding a beta2 subunit and having the restriction map of the DNA encoding the human beta2 subunit set forth in Figure 3.

Sub H
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corcl.

59. (Amended) An isolated cell [Isolated cells] containing any one or more of the nucleic acids of claim 53.

60. (Amended) An isolated cell [Isolated cells] containing one or more of the nucleic acids of claim 54.

61. (Amended) The [cells] cell of claim 59 that express a nicotinic acetylcholine receptor that contains one or more subunits encoded by the nucleic acids.

Sub H
62. (Amended) The [cells] cell of claim 59 that is a eukaryotic cell[, wherein said cells eukaryotic cells].

63. (Amended) The [cells] cell of claim 59 that is a bacterial cell[, wherein said cells are bacterial cells], mammalian [cells] cell, yeast [cells] cell or amphibian [oocytes] oocyte.

Sub H
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66. (Amended) The [cells] of claim 59[, wherein said cells contain] that contains nucleic acid encoding an alpha subunit and a beta subunit of a human neuronal nicotinic acetylcholine receptor.

67. (Amended) The [cells] cell of claim 66, wherein said alpha subunit of the human neuronal nicotinic receptor is selected from [the] an alpha2 subunit or [the] an alpha3 subunit, and said beta subunit is [the] a human beta2 subunit.

68. (Amended) A method for screening compounds for activity as nicotinic acetylcholine receptor agonists or antagonists, said method comprising:

Sub H
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contacting cells [of claim 61] with a test compound, and thereafter

monitoring [the] nicotinic acetylcholine receptor activity of the cells by monitoring the performance of the cells by measuring a performance parameter selected from the group consisting of the flux of ions through the membranes of the cells, nicotine binding to [the] nicotinic acetylcholine receptors, [and the electrophysiological response of the cells] or the electrophysiological response of the cells, wherein:

SB H7
X5 wcl.

the cells contain one or more nucleic acids comprising a sequence of nucleotides (i) encoding an alpha2 subunit of a human nicotinic acetylcholine receptor and comprising a sequence of nucleotides set forth SEQ ID No. 1 and 3, (ii) encoding an alpha3 subunit of a human nicotinic acetylcholine receptor and comprising a sequence of nucleotides set forth in SEQ ID No. 5 and 7, or (iii) encoding a beta2 subunit of a human neuronal nicotinic acetylcholine receptor and comprising a sequence of nucleotides set forth in SEQ ID No. 9; and

the cells express a nicotinic acetylcholine receptor that contains one or more subunits encoded by the nucleic acids.

71. (Amended) [A substantially pure] An isolated human neuronal nicotinic acetylcholine receptor, comprising at least one human alpha receptor subunit and at least one human beta subunit.

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SB X9

72. (Amended) A method of making cells having neuronal nicotinic acetylcholine receptor activity, comprising:

(a) introducing one or more nucleic acid molecules [of claim 53] that encode(s) at least one alpha subunit of a neuronal nicotinic acetylcholine receptor and at least one beta subunit of a neuronal nicotinic acetylcholine receptor, eukaryotic cells, wherein the nucleic acid encoding an α subunit comprises the sequence of amino acids encoded by SEQ ID No. 1 or 3, or comprises the sequence of amino acids encoded by SEQ ID No. 5 or 7, and the nucleic acid encoding the beta subunit comprises the sequence of amino acids encoded by SEQ ID No. 9;

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*Sub Hq
76
cont.*

(b) selecting cells from (a) that express the alpha or the beta encoding nucleic acid or express the alpha and beta subunit-encoding nucleic acid; and
(c) detecting neuronal nicotinic acetylcholine receptor activity in the selected cells, wherein the activity is mediated by a receptor containing one or more of the alpha and beta subunits encoded by said introduced nucleic acid molecules.

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76. (Amended) [A substantially pure] An isolated subunit of a human nicotinic acetylcholine receptor encoded by the [molecule] nucleic acid of claim 73.

77. (Amended) [A substantially pure] An isolated subunit of a human nicotinic acetylcholine receptor encoded by the [molecule] nucleic acid of claim 74.

*Sub H11
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82. (Amended) [A substantially pure] An isolated subunit of a human nicotinic acetylcholine receptor encoded by the [molecule] nucleic acid of claim 79.

83. (Amended) [A substantially pure] An isolated subunit of a human nicotinic acetylcholine receptor encoded by the [molecule] nucleic acid of claim 80.

84. (Amended) [A substantially pure] An isolated subunit of a human nicotinic acetylcholine receptor encoded by the [molecule] nucleic acid of claim 81.

*79
Sub H12*
91. (Amended) The [cells] cell of claim 61[, wherein said cells] that additionally [contain] contains a reporter gene expression construct; and the reporter gene expression construct comprises:

a transcriptional control element, and
a reporter gene encoding a transcriptional and/or translational product;
the transcriptional control element, in said cell, is responsive to an intracellular condition that occurs when a human neuronal nicotinic

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acetylcholine receptor interacts with a compound having agonist or antagonist activity with respect to said receptor;

said product can be, directly or indirectly, detected; and

the reporter gene is in operative association with said transcriptional control element.

92. (Amended) A method for screening test compounds for activity as nicotinic acetylcholine receptor agonists or antagonists, comprising:

comparing the difference in the amount of transcription of a reporter gene in the cells[of claim 91] in the presence of the compound with the amount of transcription in the absence of the compound or with the amount of transcription in the control cells that do not express nicotinic acetylcholine receptors, but contain the reporter gene expression construct, wherein compounds that exhibit activity as agonists or antagonists are identified, wherein:

the cells contain one or more nucleic acids comprising a sequence of nucleotides (i) encoding an alpha2 subunit of a human nicotinic acetylcholine receptor and comprising a sequence of nucleotides set forth SEQ ID No. 1 and 3, (ii) encoding an alpha3 subunit of a human nicotinic acetylcholine receptor and comprising a sequence of nucleotides set forth in SEQ ID No. 5 and 7, or (iii) encoding a beta2 subunit of a human neuronal nicotinic acetylcholine receptor and comprising a sequence of nucleotides set forth in SEQ ID No. 9;

the cells also contain a reporter gene expression construct;

the reporter gene expression construct comprises:

a transcriptional control element, and

a reporter gene encoding a transcriptional and/or translational product;

the transcriptional control element, in said cell, is responsive to an intracellular condition that occurs when a human neuronal nicotinic acetylcholine receptor interacts with a compound having agonist or antagonist activity with respect to said receptor;